

ATTORNEY DOCKET NO.: 05015.0365U1

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an ester forming derivative thereof, and R¹⁴ is selected from the group consisting of one or more of 1,4-terephthalic acid, 1,3-terephthalic acid, 2,6-naphthoic acid, 1,5-naphthoic acid, and an ester forming derivative thereof.

REMARKS

The Office Action has rejected claims 1-5, 7-18, 20-22, and 24-28. Claims 8, 12-13, 16 and 20 have been withdrawn from consideration. Claims 1, 7, 10, 22 and 24 have been amended herein to further define the invention so as to recite that articles are prepared from or comprise the biodegradable polymer compositions recited. Support for these amendments is found in the specification at page 16, lines 5-7. Claims 7 and 24 have been amended to correct a typographical error where "diethylene" was omitted from the term "glycol". A mark-up version of the amended claims is attached herewith. In light of the Amendment and Remarks herein, it is respectfully stated that the application is in condition for allowance.

II. Rejection in Light of Blumenthal

The Office Action has rejected claims 1-5, 7, 9-11, 14-15, 17-18, 21-22 and 24-28 under 35 U.S.C. § 102(b) as being anticipated or obvious over Blumenthal *et al.* (U.S. Patent No. 5,750,605), with the rejection based upon the grounds asserted in a prior Office Action. In that prior Office Action, it was alleged that the reference teaches compositions comprising biodegradable polyester and terepene-phenol resin. The Office Action further asserted that because the terepene-phenol resin inherently slows the degradation rate of the degradable polyester, use of the aliphatic-aromatic copolyester would have been obvious in light of the teachings of these references.

Claims 1 and 10 have been amended to recite a method of preparing an article from a biodegradable polymer or polymer composition. Wherein the article comprises: a film, a bottle, a blow molded article, an injection molded article or a container. Claim 22 has been amended to recite articles comprising from the recited biodegradable

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compositions, wherein the articles comprise: a film, a bottle, a blow molded article, an injection molded article or a container.

Blumenthal discloses hot melt adhesives that can comprise phenol terepene resin. Blumenthal does not disclose that the compositions therein may be used in articles wherein the articles comprise: a film, a bottle, a blow molded article, an injection molded article or a container. As such, Blumenthal does not anticipate the present invention.

Moreover, Blumenthal does not suggest or motivate one to prepare a an article from the polymer compositions disclosed therein. To the contrary, Blumenthal discloses hot melt adhesive compositions which, as would be recognized by one of ordinary skill in the art, cannot be used in the manner recited in the claims of this application. That is, hot melt adhesives are used to seal two or more surfaces together and such properties would be not be useable to prepare articles from such adhesive compositions. As such, it is respectfully contended that Blumenthal does not render the present invention obvious.

III. Rejection in light of Schoenberg, Rutherford, Iovine or Kaufman

The Office Action has rejected claims 1-5, 9-11, 14-15, 17-18, 21-22 and 25-28 under 35 U.S.C. § 102(b) or, alternatively, as obvious in view of Schoenberg, Rutherford, Iovine or Kaufman as was asserted in a prior Office Action. In that prior Office Action it was asserted that each of the references discloses compositions comprising degradable polymer and terpene-phenol resin. Applicants acknowledge that claims 7 and 27 were not included in this rejection in the present Office Action.

Schoenberg *et al.* (U.S. Patent No. 5,942,405) discloses graft copolymers prepared from lactide and ethylenically unsaturated monomers that may be used in hot melt adhesives or pressure sensitive adhesives. Rutherford *et al.* (U.S. Patent No. 5,753,364) discloses for pressure sensitive adhesives prepared from materials comprising poly(β -hydroxyorganoates) which are ester-containing materials derived from bacteria. Rutherford's compositions may comprise a phenol-terepene tackifier. Iovine *et al.* (U.S. Patent No. 5,252,646) discloses hot melt adhesives comprising polylactide homo- or

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copolymer and a tackifying resin, wherein the tackifying resins may be terepene phenols. Kauffmann *et al.* (U.S. Patent No. 5,169,889) discloses hot melt adhesives derived from the fermentation of sugars; Kaufman's compositions may comprise phenol terpene resins.

As with Blumenthal above, Schoenberg, Rutherford, Iovine and Kauffman disclose adhesive compositions. There is no disclosure of the articles now claimed by Applicants. As such, these references do not anticipate the present invention.

Additionally, the adhesives of Schoenberg, Rutherford, Iovine and Kauffman do not suggest or motivate that the adhesive compositions therein could be utilized to prepare articles as now claimed by Applicants nor would one of ordinary skill in the art find the requisite suggestion or motivation present. As such, it is respectfully contended that these references do not render the presently claimed invention obvious.

III. Objections to claims 7 and 24

The Office Action has objected to claims 7 and 24 under 37 C.F.R. 1.75(c). Applicants have amended these claims to correct the reference to diethylene glycol.

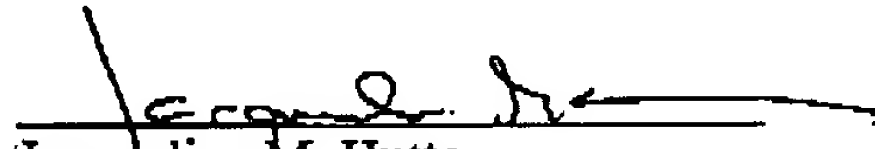
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CONCLUSION

In light of the above Amendment and Remarks, Applicants respectfully request that the rejections be withdrawn.

Payment in the amount of \$850.00 for the One Month Extension of Time and the RCE filing fee is to be charged to a credit card and such payment is authorized by the signed, enclosed document entitled: Credit Card Payment Form PTO-2038. No additional fee is believed due; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,
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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this AMENDMENT is being sent via facsimile transmission addressed to (703) 872-9311, ATTN: EXAMINER P. SHORT, GROUP 1712, BOX RCE, Commissioner for Patents, Washington, D.C. 20231, on the date shown below.


Jacqueline M. Hutter

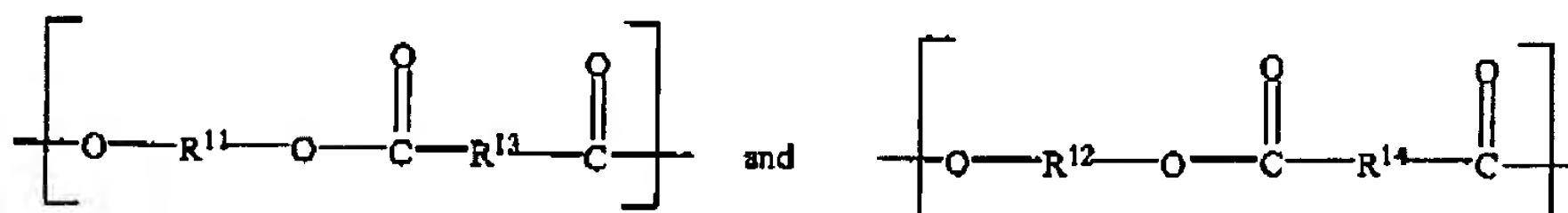
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MARKED-UP VERSION OF AMENDMENTS

1. A method for [slowing the degradation rate of] preparing a an article from a biodegradable polymer composition wherein the method comprises:
 - a. introducing a phenol-containing compound comprising terpene-phenol resin into a biodegradable polymer or biodegradable polymer composition in an amount sufficient to slow the degradation rate of the biodegradable polymer or biodegradable polymer composition; and
 - b. mixing the phenol-containing compound with the biodegradable polymer or biodegradable polymer composition;
 wherein the biodegradable polymer or biodegradable polymer composition comprises one or more of:
 1. an aliphatic-aromatic copolyester having repeat units of the following structures:



wherein

- (i) R^{11} and R^{12} are the same or different, and are residues of one or more of diethylene glycol, propylene glycol, 1,3-propanediol, 2,2-dimethyl-1,3-propanediol, 1,3-butanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, 2,2,4-trimethyl-1,6-hexanediol, thiodiethanol, 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, triethylene glycol, or tetraethylene glycol;
- (ii) R^{11} and R^{12} are 100% of the diol components in the copolyester;
- (iii) R^{13} is absent or is selected from one or more of the groups consisting of $\text{C}_1 - \text{C}_{12}$ alkylene or oxyalkylene; $\text{C}_1 - \text{C}_{12}$ alkylene or

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oxyalkylene substituted with one to four substituents

independently selected from the group consisting of halo, C₆ - C₁₀aryl, and C₁ - C₄ alkoxy; C₅ - C₁₀ cycloalkylene; and C₅ - C₁₀

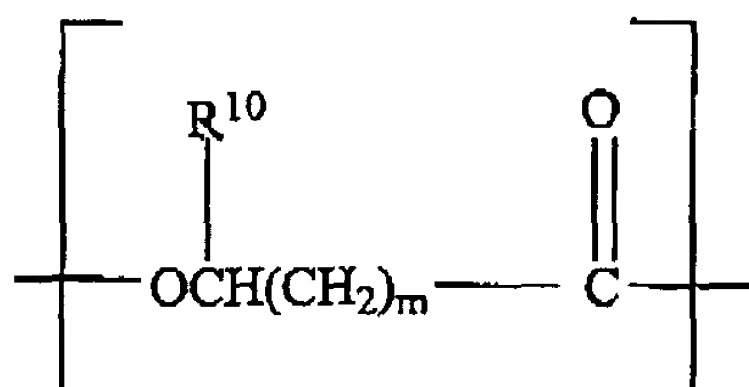
cycloalkylene substituted with one to four substituents

independently selected from the group consisting of halo, C₆ - C₁₀aryl, and C₁ - C₄ alkoxy; and(iv) R¹⁴ is selected from one or more of the groups consisting ofC₆ - C₁₀ aryl, and C₆ - C₁₀ aryl substituted with one to four

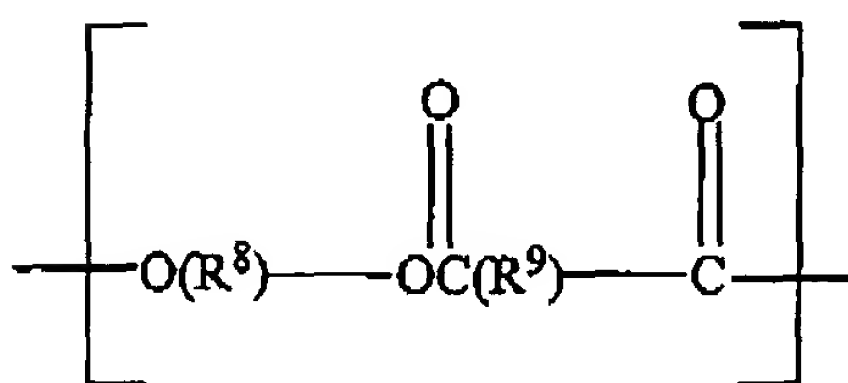
substituents independently selected from the group consisting of

halo, C₁ - C₄ alkyl, and C₁ - C₄ alkoxy;

2. an aliphatic polyester having repeat units of one or more of the following structures:



or



wherein m is an integer of from 0 to 10, and R¹⁰ is selected from the group consisting of hydrogen; C₁-C₁₂ alkyl; C₁-C₁₂ alkyl substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy; C₅-C₁₀ cycloalkyl; and C₅-C₁₀ cycloalkyl

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substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy, wherein R⁸ is selected from the group consisting of C₂-C₁₂ alkylene or C₂-C₁₂ oxyalkylene; C₂-C₁₂ alkylene or C₂-C₁₂ oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy; C₅-C₁₀ cycloalkylene; C₅-C₁₀ cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy, and wherein R⁹ is absent or is selected from one or more of the group consisting of C₁-C₁₂ alkylene or oxyalkylene; C₁-C₁₂ alkylene or oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy; C₅-C₁₀ cycloalkylene; and C₅-C₁₀ cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy; and

4) a C₁-C₁₀ cellulose ester having a DS equal to or less than about 2.5; and

c. forming the biodegradable polymer composition into an article, wherein the article comprises: a film, a bottle, a blow molded article, an injection molded article or a container.

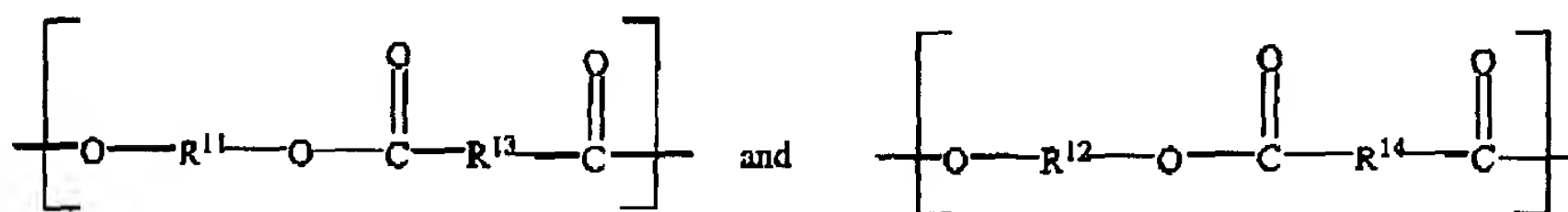
8. (Twice Amended) The method of claim 1 wherein the biodegradable polymer or biodegradable polymer composition comprises the aliphatic-aromatic copolyester and wherein R¹¹ and R¹² are the same or different, and are selected from the group consisting of residues of one or more of diethylene glycol, propylene glycol, 1,3-propanediol, 1,3-butanediol, and 1,4-butanediol, R¹³ is selected from the group consisting of malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, 2,2-dimethyl glutaric acid, diglycolic acid, and an ester forming derivative

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thereof, and R^{14} is selected from the group consisting of one or more of 1,4-terephthalic acid, 1,3-terephthalic acid, 2,6-naphthoic acid, 1,5-naphthoic acid, and an ester forming derivative thereof.

10. (Twice Amended) A method for [slowing the degradation rate of] preparing an article from a biodegradable polymer or polymer composition, wherein the method comprises:
- (a) introducing a phenol-containing compound into a biodegradable polymer or polymer composition in an amount sufficient to slow the degradation rate of the biodegradable polymer or polymer composition; and
 - (b) mixing the phenol-containing compound with the biodegradable polymer or polymer composition, wherein the biodegradable polymer comprises one or more of the following:
 1. an aliphatic-aromatic copolyester having repeat units of the following structures:



wherein

- (i) R^{11} and R^{12} are the same or different, and are residues of one or more of diethylene glycol, propylene glycol, 1,3-propanediol, 2,2-dimethyl-1,3-propanediol, 1,3-butanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, 2,2,4-trimethyl-1,6-hexanediol, thiodiethanol, 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, triethylene glycol, or tetraethylene glycol;
- (ii) R^{11} and R^{12} are 100% of the diol components in the copolyester;
- (iii) R^{13} is absent or is selected from one or more of the groups consisting of $C_1 - C_{12}$ alkylene or oxyalkylene; $C_1 - C_{12}$ alkylene or

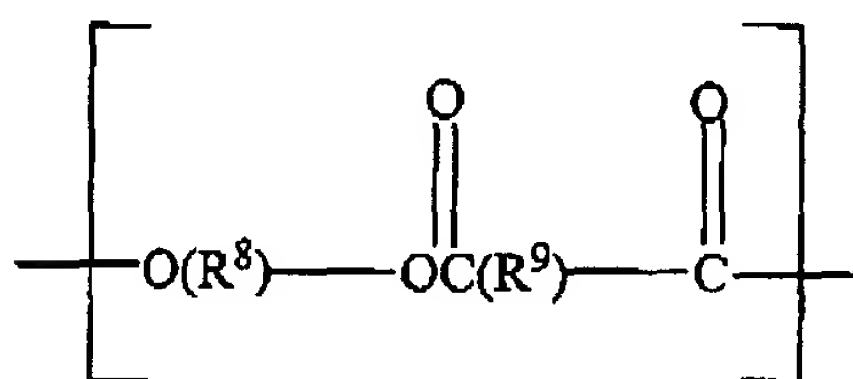
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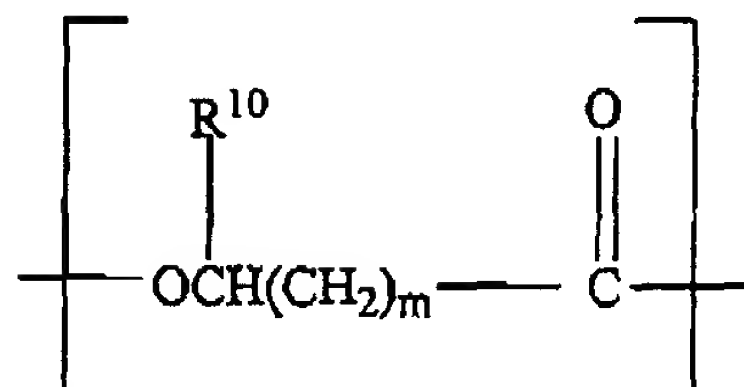
oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆ - C₁₀ aryl, and C₁ - C₄ alkoxy; C₅ - C₁₀ cycloalkylene; and C₅ - C₁₀ cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C₆ - C₁₀ aryl, and C₁ - C₄ alkoxy; and

(iv) R¹⁴ is selected from one or more of the groups consisting of C₆ - C₁₀ aryl, and C₆ - C₁₀ aryl substituted with one to four substituents independently selected from the group consisting of halo, C₁ - C₄ alkyl, and C₁ - C₄ alkoxy;

- 4) an aliphatic polyester having repeat units of one or more of the following structures:



or



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wherein m is an integer of from 0 to 10, and R^{10} is selected from the group consisting of hydrogen; C_1 - C_{12} alkyl; C_1 - C_{12} alkyl substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; C_5 - C_{10} cycloalkyl; and C_5 - C_{10} cycloalkyl substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy,

wherein R^8 is selected from the group consisting of C_2 - C_{12} alkylene or C_2 - C_{12} oxyalkylene; C_2 - C_{12} alkylene or C_2 - C_{12} oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; C_5 - C_{10} cycloalkylene; C_5 - C_{10} cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy, and

wherein R^9 is absent or is selected from one or more of the group consisting of C_1 - C_{12} alkylene or oxyalkylene; C_1 - C_{12} alkylene or oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; C_5 - C_{10} cycloalkylene; and C_5 - C_{10} cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; and

5) C_1 - C_{10} cellulose ester having a DS equal to or less than about 2.5; and

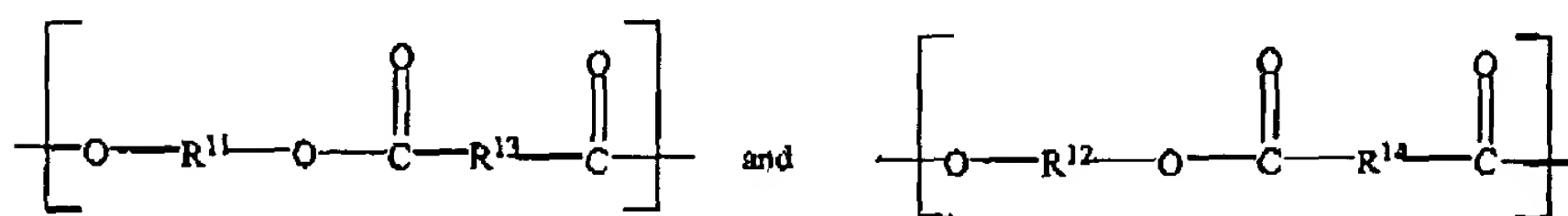
(c) forming the biodegradable polymer composition into an article, wherein the article comprises: a film, a bottle, a blow molded article, an injection molded article or a container.

23. (Twice Amended) A biodegradable polymer composition for making an article comprising a film, a bottle, a blow molded article, an injection molded article or a container, wherein the biodegradable polymer or biodegradable polymer-second material composition comprises [comprising]:

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- a. a phenol-containing compound comprising terpene-phenol resin incorporated in the biodegradable polymer or biodegradable polymer-second material composition, the phenol-containing compound being present at an amount sufficient to slow the degradation rate of the biodegradable polymer or biodegradable polymer second-material composition; and
- b. a biodegradable polymer or biodegradable polymer-second material composition comprising one or more of the following:
 1. an aliphatic-aromatic copolyester having repeat units of the following structures:



wherein

- (i) R^{11} and R^{12} are the same or different, and are residues of one or more of diethylene glycol, propylene glycol, 1,3-propanediol, 2,2-dimethyl-1,3-propanediol, 1,3-butanediol, 1,4-butanediol, 1,5-pentanediol, 1,6-hexanediol, 2,2,4-trimethyl-1,6-hexanediol, thiodiethanol, 1,3-cyclohexanedimethanol, 1,4-cyclohexanedimethanol, 2,2,4,4-tetramethyl-1,3-cyclobutanediol, triethylene glycol, or tetraethylene glycol;
- (ii) R^{11} and R^{12} are 100% of the diol components in the copolyester;
- (iii) R^{13} is absent or is selected from one or more of the groups consisting of $\text{C}_1 - \text{C}_{12}$ alkylene or oxyalkylene; $\text{C}_1 - \text{C}_{12}$ alkylene or oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, $\text{C}_6 - \text{C}_{10}$ aryl, and $\text{C}_1 - \text{C}_4$ alkoxy; $\text{C}_5 - \text{C}_{10}$ cycloalkylene; and $\text{C}_5 - \text{C}_{10}$ cycloalkylene substituted

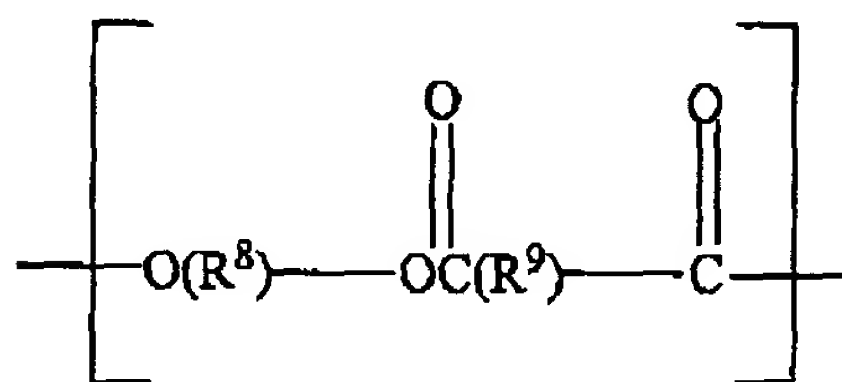
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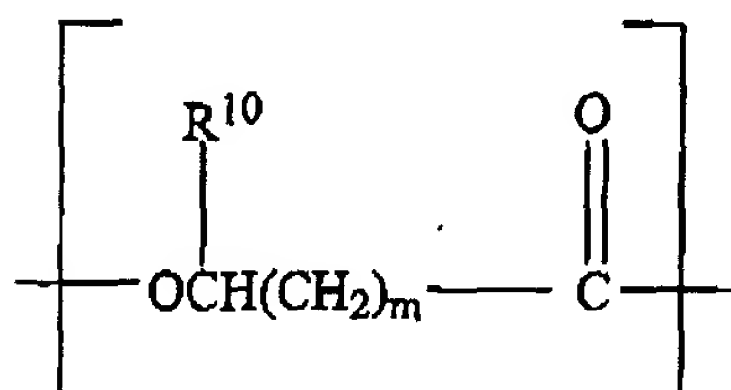
with one to four substituents independently selected from the group consisting of halo, C₆ - C₁₀ aryl, and C₁ - C₄ alkoxy; and

(iv) R¹⁴ is selected from one or more of the groups consisting of C₆ - C₁₀ aryl, and C₆ - C₁₀ aryl substituted with one to four substituents independently selected from the group consisting of halo, C₁ - C₄ alkyl, and C₁ - C₄ alkoxy;

- 2) an aliphatic polyester having repeat units of one or more of the following structures:



or



wherein m is an integer of from 0 to 10, and R¹⁰ is selected from the group consisting of hydrogen; C₁-C₁₂ alkyl; C₁-C₁₂ alkyl substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy; C₅-C₁₀ cycloalkyl; and C₅-C₁₀ cycloalkyl substituted with one to four substituents independently selected from the group consisting of halo, C₆-C₁₀ aryl, and C₁-C₄ alkoxy,

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wherein R^8 is selected from the group consisting of C_2 - C_{12} alkylene or C_2 - C_{12} oxyalkylene; C_2 - C_{12} alkylene or C_2 - C_{12} oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; C_5 - C_{10} cycloalkylene; C_5 - C_{10} cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy, and

wherein R^9 is absent or is selected from one or more of the group consisting of C_1 - C_{12} alkylene or oxyalkylene; C_1 - C_{12} alkylene or oxyalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; C_5 - C_{10} cycloalkylene; and C_5 - C_{10} cycloalkylene substituted with one to four substituents independently selected from the group consisting of halo, C_6 - C_{10} aryl, and C_1 - C_4 alkoxy; and

3) C_1 - C_{10} cellulose ester having a DS equal to or less than about 2.5.

24. The biodegradable polymer composition of claim 23 wherein the biodegradable polymer or biodegradable polymer-second material composition comprises the aliphatic-aromatic copolyester and wherein R^{11} and R^{12} are the same or different, and are selected from the group consisting of residues of one or more of diethylene glycol, propylene glycol, 1,3-propanediol, 1,3-butanediol, and 1,4-butanediol, R^{13} is selected from the group consisting of malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, 2,2-dimethyl glutaric acid, diglycolic acid, and an ester forming

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